
Mosiera (Myrtaceae) in Mexico and Mesoamerica

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ABSTRACT. The history and relationships of the mainly Caribbean genus *Mosiera* are discussed, and it is comprehensively described. Two Mexican and Mesoamerican species, *Psidium contrerasii* and *P. ehrenbergii*, are transferred to *Mosiera*.

Generic limits among the American Myrtinae (Myrtaceae) have long been obscure. Historically the greatest problem has been definition of the limits of *Psidium* L., a large, diverse, and poorly defined group to which many species of Myrtinae (e.g., *P. contrerasii* Lundell and *P. ehrenbergii* (Berg) Burret) have been assigned for want of a better place. Recently, Landrum & Sharp (1989) have described and illustrated seed coat characters that can be correlated with floral characters to separate *Psidium* from related genera, but the above two species are among a few that must be relocated. *Psidium contrerasii* and *P. ehrenbergii* are here assigned to *Mosiera*, a genus that mainly has been ignored since its description by Small (1933).

HISTORY OF *MOSIERA*

Small (1933) created *Mosiera* to contain two species from southern Florida that he had earlier (1913) recognized as belonging to *Anamomis* Griseb. (= *Myrcianthes* Berg). I agree with McVaugh (1973) that Small's original two species are best considered as one. Small assigned both *Anamomis* and *Mosiera* to the tribe Eugeniinae, where only the first genus belongs. Small recognized the species of *Mosiera* he had before him as being distinct from *Anamomis* because of characteristics of the fruit and inflorescence. Apparently unknown to him was the striking difference in embryo structure, the character of primary importance in differentiating subtribes of Myrteae.

Burret (1941), in his worldwide revision of *Myrtus* L. and segregate genera, considered *Mosiera* to be a synonym of *Myrtus*. Burret's concept of *Myrtus* included the Mediterranean type, *M. communis* L., a north African species, and a complex of Caribbean species, including the two that Small had originally placed in *Mosiera*.

McVaugh (1968) considered the Caribbean complex that Burret had placed in *Myrtus* to be more closely related to American genera (e.g., *Calycolpus*

Berg) than *Myrtus*, but he did not then transfer them to *Mosiera* or any other American genus, considering that a more thorough knowledge was required before a final position could be assigned. Later (1973), he transferred the type species of *Mosiera* (*M. longipes* (Berg) Small) to *Psidium*.

In a posthumous publication, Bisse (1985) transferred several Cuban species of *Myrtus*, in the sense of Burret, and some species of *Psidium* to *Mosiera*. His inclusion of *Psidium guineense* Sw. in *Mosiera* leads me to believe that his concept of the genus was quite different from mine. I consider *Psidium guineense* to be a typical species of *Psidium* and, in fact, a close relative of *P. guajava* L., the type.

A revision of *Mosiera* is underway, but I believe that it is important that *Psidium contrerasii* and *P. ehrenbergii* be transferred now so that the correct names can be used in other publications and to bring attention to a genus until now unknown in Mexico and Central America. *Mosiera* is here for the first time critically compared to other genera and comprehensively described.

Mosiera Small, Man. S. E. Fl., 936. 1933. LECTOTYPE: *Mosiera longipes* (Berg) Small (= *Eugenia longipes* Berg) selected by McVaugh (1956).

Shrubs or trees to 15 m high. Hairs whitish, yellowish, or reddish brown, unicellular, simple, to ca. 0.5 mm long. Leaves persistent, coriaceous, the venation brochidodromous, with few to ca. 10 pairs of lateral veins that are united by a marginal vein that arcs between them near the leaf margin. Inflorescence a solitary axillary flower (infrequently a 3-flowered dichasium) or an axillary bracteate shoot with 1–3 decussate pairs of flowers. Flowers tetramerous; calyx lobes oblong to hemiorbicular, the calyx usually not fused or only slightly fused beyond the ovary's summit, tearing slightly or not at all between the lobes at anthesis; petals submembranous, white; bracteoles usually small, ovate-triangular, foliose in one species, caducous at about or before anthesis; stamens 60–200, folded toward the center in the bud; anthers globose, 0.3–0.7 mm long, usually with one terminal gland in the connective; ovary 2-locular; ovules 3–40 per locule, the placenta not prominent, the locules sometimes connected by an open-

ing. Fruit subglobose; seeds few, subreniform, the seed coat hard, lustrous, or in one species leathery and glandular, the external wall one to a few cells thick, the surface cells rounded to elongate, the central portion of the seed sometimes soft; embryo oily, whitish, C-shaped, the cotyledons reflexed or straight, less than $\frac{1}{4}$ the length of the embryo.

RELATIONSHIP TO *EUGENIA* (EUGENIINAE) AND OTHER GENERA OF MYRTINAE

Mosiera has been submerged in *Myrtus* and *Psidium* and is also probably closely related to *Caly-*

colpus. It is now clear that *Mosiera* is tetramerous while the others are all typically pentamerous, so there should be no confusion. On the other hand, *Mosiera* is superficially similar to *Chamguava* Landrum (Myrtinae) and *Eugenia* L. (Eugeniinae) and can easily be confused with either. Examination of embryos is the only certain way to distinguish these three genera. The synoptic key below summarizes the differences among all the above-mentioned genera.

- 1a. Embryo a solid mass, made up of the fused cotyledons, the hypocotyl usually not distinguishable; flowers tetramerous; inflorescence a solitary flower, or a bracteate shoot of 2 to a few decussate pairs of flowers *Eugenia*
- 1b. Embryo at least half hypocotyl, the cotyledons distinguishable as erect or reflexed flaps at the apex; flowers tetramerous or pentamerous; inflorescence various.
 - 2a. Seed coats membranous, thin, never verrucose; seeds to ca. 6–10 mm long; embryo starchy, the hypocotyl swollen, much wider than the cotyledons, a central core of vascular tissue clearly distinguishable from the surrounding cortex (in section); placenta often a protruding peltate structure; flowers tetramerous *Chamguava*
 - 2b. Seed coats hard, bony, or in *Mosiera ehrenbergii* leathery, verrucose; seed often less than 6 mm long; embryo oily, the hypocotyl not greatly swollen, about the same width as the cotyledons, a central core of vascular tissue not clearly distinguishable from the surrounding cortex; placenta protruding or not; flowers tetramerous or pentamerous.
 - 3a. Flowers tetramerous; seed coat smooth, lustrous, or leathery-verrucose; cotyledons much shorter than the hypocotyl; anthers usually with a single terminal gland in the connective *Mosiera*
 - 3b. Flowers pentamerous; seed dull to rough (*Psidium*) or smooth, lustrous (*Calycolpus*, *Myrtus*); cotyledons about the same length as the hypocotyl (*Myrtus*), or much shorter (*Calycolpus*, *Psidium*); anthers with a few to several glands in the connective (occasionally with a single terminal gland in *Myrtus*).
 - 4a. Seed coat dull or rough, not lustrous, covered with a thin layer of pulpy tissue when wet (or a glaze or crusty layer when dry), the hard portion of the seed coat (5–)8–30 cells thick at narrowest point; calyx tearing irregularly or between the lobes at anthesis; peduncles rarely in pairs on very short axillary shoots *Psidium*
 - 4b. Seed coat lustrous, smooth, not covered with a thin layer of pulpy or crusty tissue or a glaze, the hard portion of the seed coat 1–5 cells thick at narrowest point; calyx tearing between the lobes or not at all at anthesis; peduncles often in pairs on very short axillary bracteate shoots.
 - 5a. Hypocotyl about equaling the cotyledons in length; calyx lobes triangular, unfused or scarcely fused beyond the summit of the ovary, without an apical appendage; anthers oblong, to ca. 1 mm long; ovary 2–3-locular; Mediterranean *Myrtus*
 - 5b. Hypocotyl much longer than the cotyledons; calyx lobes variously shaped, often fused well beyond the summit of the ovary, often with an elliptic or linear apical appendage; anthers oblong to linear, to ca. 2.5 mm long; ovary 2–6-locular; Central America and northern South America *Calycolpus*

Mosiera contrerasii (Lundell) Landrum, comb. nov. Basionym: *Psidium contrerasii* Lundell, *Wrightia* 5(4): 84. 1975. TYPE: Guatemala. Petén: La Cumbre, in zapotal on top of hill, W of km 141–142 on the Petén–Izabal road, 12 Mar. 1975 (fl), *Lundell & Contreras 19085* (holotype, LL).

Tree 7–15 m high, glabrous or essentially so except for minute, obscure pubescence on youngest twigs and buds and on calyx lobes; hairs less than

0.3 mm long, whitish or reddish brown; young twigs light reddish brown or greenish, smooth, within about 1 year becoming gray to gray-tan, remaining smooth or becoming slightly flaky. Leaves ovate to lanceolate, 3–7.3 cm long, 1.2–2.5 cm wide, 2–3 times as long as wide, the margin slightly revolute when dry; apex bluntly acuminate; base rounded, cuneate, or acuminate, sometimes oblique; petiole channeled, 3–7 mm long, 0.5–1 mm thick; midvein impressed slightly above, prominent below; lateral veins about 7–10 straight pairs that extend from the midvein

to the marginal vein, alternating with weaker, branching veins that appear to arise in the marginal vein and extend back toward the midvein, sometimes impressed slightly above; blades subcoriaceous, drying gray-green to dark yellow-green, usually somewhat lustrous above, densely glandular. Peduncles uniflorous, 0.4–2 cm long, 0.5–1 mm wide, usually at leafless nodes, solitary or less often in pairs on short shoots; bracteoles caducous before anthesis, foliose, elliptic-linear, 4–6 mm long; calyx lobes ovate-oblong, ca. 2 mm long and wide, concave, pubescent within, glabrous proximally to pubescent distally without; petals suborbicular, ca. 4 mm long; hypanthium campanulate, 1.5–2 mm long; disk 1.5–2 mm across; stamens 60–70, to ca. 4 mm long; anthers ca. 0.3 mm long; style ca. 4 mm long; ovary 2-locular; ovules 7–11 per locule, biseriate, the placenta central; fruit globose, ca. 8 mm wide; seeds 4–10 per fruit, subreniform, ca. 4 mm long, lustrous light yellow.

Phenology. Flowering from March to June; fruit maturing May to September.

Habitat. As far as is known, growing in seasonally dry, partially deciduous tropical forest on limestone.

Additional specimens examined. GUATEMALA. PETÉN: La Cumbre, zapotal, W of km 141–142 of Petén–Izabal road, on top of hill, 12 Mar. 1975 (young fr), *Lundell & Contreras 19086, 19089*, 10 May 1975 (fr) *19278*, 11 Sep. 1975 (fr), *19847* (all LL). MEXICO. QUINTANA ROO: km 33 del camino Carrillo Puerto–Vigía Chico, 29 July 1983 (fr), *Durán & Olmsted 381* (MO); 1 km al S del camino que nace 8 km al W de Vigía Chico, 5 Aug. 1983 (fr), *Durán et al. 400* (MO); Carrillo Puerto, Si-anka'an, 14 km al SE del crucero de Chumpon, 7 June 1984 (fl), *Durán & Sánchez 990* (MEXU).

Mosiera ehrenbergii (Berg) Landrum, comb. nov.

Basionym: *Myrtus ehrenbergii* Berg, *Linnaea* 27: 404. 1856. *Psidium ehrenbergii* (Berg) Burret, *Notizbl. Bot. Gart. Berlin-Dahlem* 15: 483. 1941. TYPE: Mexico. *Ehrenberg 1039* (holotype, B destroyed).

Shrub or small tree 0.5–4 m high, smooth or scaly barked; hairs whitish, erect to antrorse, ca. 0.1 mm long, essentially confined to young twigs and margins of petals and calyx lobes; young twigs reddish brown to gray-brown, densely to sparsely covered with hairs, these persisting until the first bark falls, the older twigs smooth or the bark becoming rough and flaky. Leaves elliptic, oblong, or elliptic-lanceolate, 0.9–3 cm long, 0.4–1 cm wide, 1.8–4 times as long as wide, glabrous, the margin often slightly revolute; apex obtuse or emarginate; base acute; petiole 1–2 mm long, ca. 0.5 mm thick; midvein flat or slightly raised above, prominent be-

low; lateral veins 2–7 pairs, weak, a marginal vein usually not detectable; blades subcoriaceous, usually drying gray-green, nearly concolorous, densely glandular. Peduncles uniflorous, 3–15 mm long, ca. 0.7 mm wide, flattened, solitary or more often in pairs, one opposite the other on short, leafless axillary shoots; bracteoles oblong-linear, 1–2.5 mm long, usually caducous before anthesis; calyx lobes ovate to hemiorbicular, 1.5–2 mm long and wide, glabrous or with a ciliate margin, glandular, often tinged with purple; petals suborbicular, ca. 3.5 mm long, often tinged with purple; hypanthium campanulate, 2–3 mm long, tearing slightly between the calyx lobes; disk 2–5 mm across, the staminal ring sparsely pubescent; stamens 90–130, 3–4 mm long; anthers 0.5–0.7 mm long; style 3–6 mm long; ovary 2-locular; ovules 3–11 per locule, biseriate or multiseriate; fruit subglobose, turning dark purple-black at maturity, 6–10 mm wide; seeds 1–5 per fruit, ca. 4 mm long, the seed coat not operculate, leathery, 0.1–0.2 mm thick, strongly glandular.

Phenology. Flowering mainly from May to September; fruiting mainly from August to October.

Habitat. Found growing in subtropical, seasonally deciduous scrub forest and in desert.

No type specimen has been found for *Myrtus ehrenbergii*, but the protologue leaves little doubt about the identity of the species. Isotypes may exist and should be searched for in European herbaria.

Representative specimens examined. MEXICO. HIDALGO: Cardonal, Cerro Boludo de Tolantango, 42 km al NE de Ixmiquilpan, 31 Aug. 1976 (fr), *González Medrano 9623* (MEXU). SAN LUIS POTOSÍ: 2 km E of El Abra on road from Ciudad Valles to Tampico, 130 m, 27 Oct. 1985 (st), *Bartholomew, Landrum et al. 3502* (ASU, CAS); 4 km E of Charco Blanco on road to Guadalcázar, 1,600 m, 28 Oct. 1985 (fr), *Bartholomew, Landrum et al. 3568* (ASU, CAS); San José Pass, 10 Oct. 1890 (fr), *Pringle 3524* (A, GH); Minas de San Rafael, May 1911 (fl), *Purpus 5211* (F, GH, MEXU, MICH, MO, NY, UC); 4 km al W de Lagunillas, 900 m, 29 Apr. 1965 (fl), *Rzedowski 7608* (MICH). TAMAULIPAS: 18 km al SO de Miquihuana, 1,700 m, 15 Aug. 1972 (fr), *González Medrano 4723* (MEXU); 6 km al E del Sauz, al NE de Tula, después de Francisco Medrano, 1,600 m, 7 Dec. 1976 (fr), *González Medrano 10117* (MEXU); Tula, 3 km al W del Capulín, 2,000 m, Oct. 1976 (fr), *González Medrano 10106* (MEXU); 2 km al N de la Verdolaga, cerca de Las Antonias, 12 Aug. 1972 (fr), *González Medrano et al. 4558* (MEXU, MO); 2 km al SE de Magdaleno Aguilar, 1,600–1,800 m, 20 Sep. 1976 (fr), *González Medrano et al. 9888* (MICH); Tula, 5 km al W del Ejido El Saltillo, 1,500 m, 3 July 1985 (young fr), *Hiriart 758* (MEXU); 18 km SE of Bustamante toward Presita and Tula (99°40'W, 23°21'N), 1,700 m, 20 May 1973 (fl), *Johnston et al. 11161* (ASU, CAS, MEXU, NY); 6 mi. SW of Palmillas (23°18'N, 99°39'W), 5,300 ft., 1 Aug. 1976 (fl), *Webster & Armbruster 20508* (MEXU).

Placement of *Myrtus ehrenbergii* in any genus is somewhat difficult because of its unusual seed coat, which is leathery, not operculate, and strongly glandular. The only other species of Myrtinae known to me with similar seed coats belong to the Australasian genus *Pilidiostigma*, which has a very different embryo similar to that of *Chamguava*.

McVaugh (1968) first suggested that *Myrtus ehrenbergii* was related to the complex of Caribbean species Burret referred to *Myrtus*, and that I consider to be *Mosiera*. It shares with them 4-merous flowers, oil-storing embryos with the cotyledons much shorter than the hypocotyl, ovaries with nonprotruding placentae, and inflorescences of solitary flowers or abbreviated bracteate shoots. The locules are often incompletely closed as they usually are in the ca. 10 additional species of *Mosiera*.

Another reason for believing *Myrtus ehrenbergii* belongs to *Mosiera* is its geographic position. The only other genera of Myrtinae that are geographically close are *Pimenta* and *Psidium*, both of which are dissimilar in many ways.

Mosiera ehrenbergii differs from the other species of *Mosiera* most notably in the structure of the seed coat. Similar situations exist in *Acca* and *Pimenta*, both of which have single species with unusual seed coats (*A. sellowiana* (Berg) Burret; *P. pseudocaryophyllus* (Gomes) Landrum) (Landrum, 1986).

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